Menlo Park Notebook #87 [N-80-10-23]

The few dated entries in this notebook cover the period October 1880-January 1881. Most of the book was probably used in 1880. The entries are by Charles Batchelor and Francis Upton. Some of the entries are probably by Francis Jehl and other members of the laboratory staff. Most of the material relates to electric lighting. Included are notes on steam engines, belting, and dynamos; notes and drawings relating to electric power distribution; and notes on lamp experiments. There are also drawings of a telephone switchboard. The book contains 278 numbered pages.

Blank pages not filmed: 14-19, 54-93, 106-201, 204-206, 209-258, 263.

Missing page numbers: 21-22, 197-198, 207-208, 241-242, 259-262, 265-268.

No 87

LIBRARY OF THE

BOARD OF PATENT CONTROL,

120 Broadway, New York.

May 1, 1896.

No 87 Menlo Park

New Jersey.

Menlo Park. you

1

60

420

60

500000

50

145

4500

12 25
8

5
315

350

77

70½
47
490

40
135
34
14233

12 33
3 39
15 72

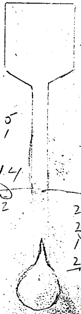
11 72
3

17½
7½

17
8

20
11

14



mug count

17½
17
17½
17
14
92

2
11
23
11
17½
17½

17
5
15
1
96
2
98½
2

9.80½
2
980

25
25
14
23

73
34
1
9

Water pipe

1/4 Mile 8in Water pipe (cast iron)	1575-00
laying Same	750-00
	$2325.00

Saving in Condensing Engines

1200 HP Cond. Eng. allows a saving over a Non. Cond. Eng. of as much as pays interest on $50.000 in coal alone

There is $9600 less invested in boilers —

Allows 1/3 less water for boilers —

Allows 1/3 less room for boilers

Allows 1/3 less depreciation in boilers

Allows a saving of $1460 in firemen per year

Allows a saving in rent

Against which must be put

over

Extra Cost of Cond. Eng over Non Cond. $8160.00

For 1200 HP boilers we should want 8000 ft condensing surface Copper pipe for this $\frac{1}{32}$ thick $\frac{5}{8}$ hole takes 3200 ft long + 1280 ft for ends = 33280 ft =
12,380 lbs at 38¢ =
$4.704.41

Cost of piping, well etc for Cond. water to be figured hereafter.

Saving in boiler water by using condensor water over and over $\frac{2}{3}$ (Surface Cond.)

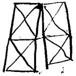
Cost of running Cond. Eng.
per hour per H.P.

Coal	·0031
labour	·0013
Oil Waste Etc	·00016
Rent.	·0011
labour doubled	·0013
	·00022
Water	·0005
Interest	·0017
Depreciatn	·0001
	·0094^8

or about 1^d per hour per H.P.

1000 revolution.

$\frac{10}{72}$) 100 (8.33
3.14
3332
833
2499
2.6.1 5 6 2



$\frac{1}{11}$

5 5
5
275
2600
165000
556
33) 715000 (21.6
66
55
33
220

2600
5
2~~0~~) 13000
6~~0~~) 65~~0~~
10.8

Belting Rules

Belt running 2600 Fpm
5 inches wide

Page IX

Each inch of width of good belting will transmit a force of 55 lbs on large pulleys . 21.6 H.P

Page XIII

$b = c\frac{H}{v}$ $H = \frac{bv}{c}$

b = breath in inches
H = horse power
v = the speed of the belt in feet
c = a constant = ?
= 26 for upright shaft
= 20 .. horizontal ..

10.8 horse power

Large pulley

1250
114

600)2600
4.33
5
5
2165

Oct.

9 oclock Speed 520 ft. p minute
10 " " 510 " "
11 " " " "
12 " " " "

Page. 17

Ordinary leather belting one inch wide having a velocity of 600 ft pm will transmit one H.P.

21.65 Horse Power.

Incandescing Arc
Sheet 1 Fig 8
Konns Brit Patent
3809 1872

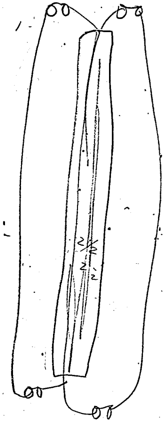
Get D'Ivernois
U. S. Patent
114,652
probably multiple arc

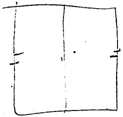
~~Harrison~~
Brit. Pat. 1858
No 1099
Bottom page 5

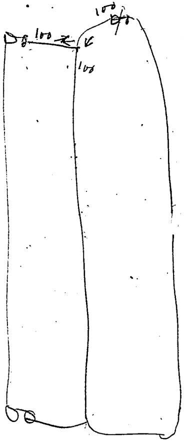
Incandescing arc
cautery battery
Trouvé
Du Moncel Applications
Vol V P 637

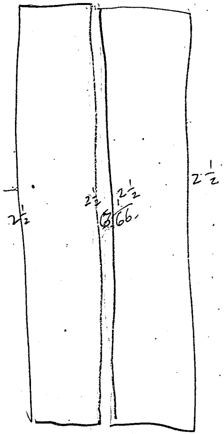
Multiple arc & fuses
Tel Journal 1893. page
32

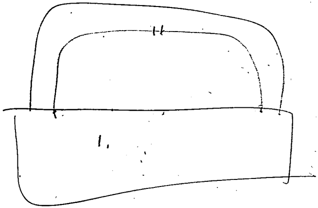
Multiple arc & heating
several wires
Tel jnl. 1893. page 43

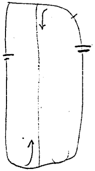

2½
2½

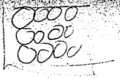



Dg
100
100
Dg
100
K


2½
2½
2½
6 66.
2½


1,





Connect Dynamo room with line to laboratory and Upton's house 4 wire on insulators outside of machine shop. Two lines for exciting machine.

~~The line~~ 6 lines.

2 Machines for power in shop

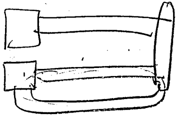
2 Machines for light in shop

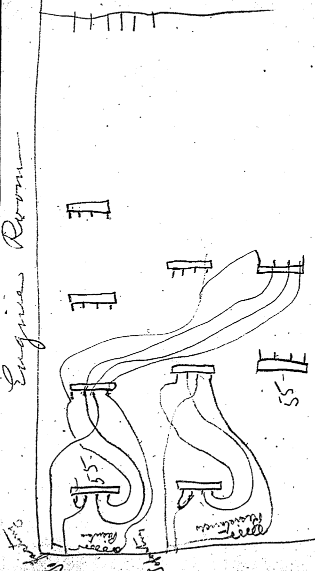
~~4~~3 machines .55 Ohms on line to Upton's house

3 machines on laboratory line and railroad or 1 .55 Ohm machine

11

1. Exciter




Engine Room
55
55
55
Resistances
Resistan
To Factory

On hand

Louis .14
here .14

2 here
1 nearly

here

ord. .55

In shop

5 machines running in room
3 outside
8 machines

3 machines .14 on factory
for power

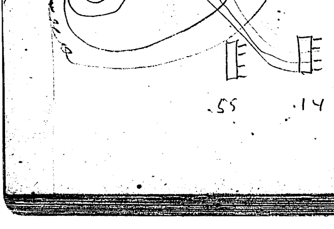
1 machine .55 for light
for factory

2 machines .55 for
running lamps in labora-
tory and if another .55
armature is not finished
2 .14 ohm

√ 3 machines with magnets
to table for experimental
and R.R.

√ 1 Exciter

Engine Room


Factory
21 19
.55
.14

Circuits underground

R.R. 6 strands

R.R Ave 6 strands

17 Strands S.E.

18 Strands N.W.

25 Strands Carmen

Overhead

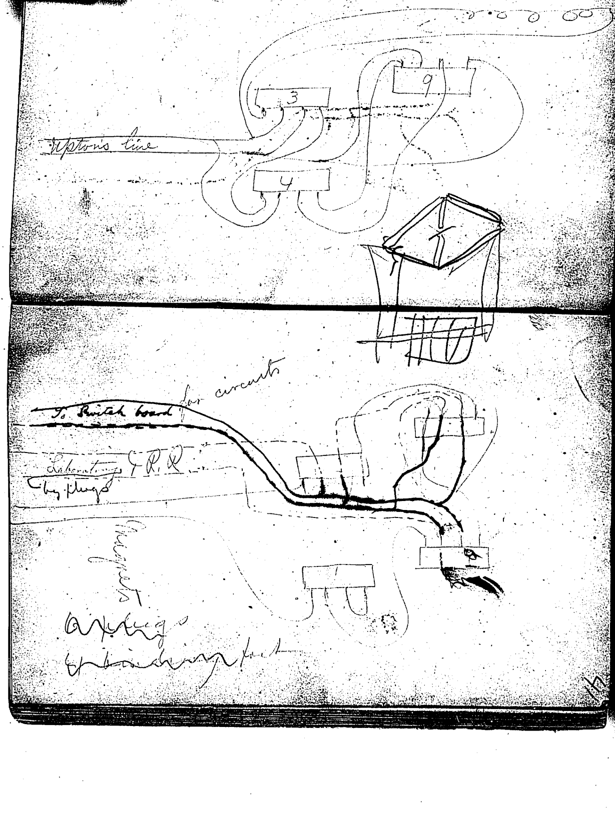
Upton

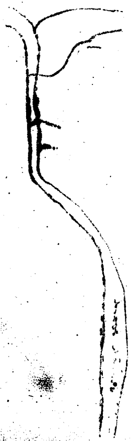
Laboratory

Magnets

Galvanometer

1875
335
1215


Uptons line
9
3
4
To Switch board for circuits
Laboratory & R.R.
by plugs
Magnets
Cutting
[illegible]



Plugs Laboratory
Uptons line

Large binding post Magnet
small for galva.

R.R. line to be carried
to left hand of switch
temporally with plugs.

Ketchum Dynamo

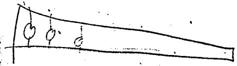
Rev 1380.
66.15 v at machine

at machine with lamps

64.13.

at the commencing of lamps 61.13

end of lamps. 45.9



other Dynamo. x

Rev 1020

Field 830

1, with 3 wires.

Ketchum Dynamo

1340,

~~54.78~~ = 52.65 vols at the first lamp.

Candels from lamps across the line 12.

51.3 at the end of the lamps

46

2112
55

~~Brought the lamps to eight candles, lamp was marked 52 volts.~~

47

Brought the lamp to about eight candles They were all whose electromotive was about 52 volts.

---

ten lamps off brought it up to 9 C.

---

twenty lamps off it gave 11 candles

---

thirty lamps off it gave 13 candles

---

fourty lamps off 16.5 candles

48

fifty Lamps off
22.5 Candles

Sixty off
26.5 Candles

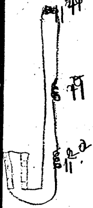
32 lamps with about
2.3 ohms in gives 8 C

68 lamps, at 8 with
14 ohms.

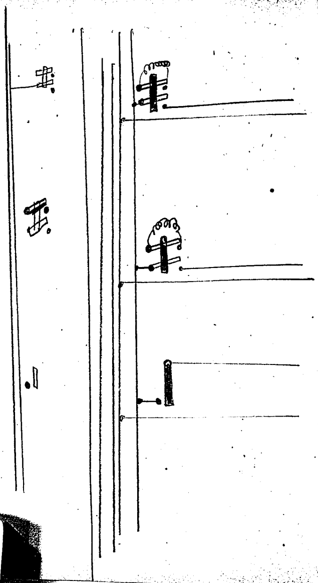
98 lamp at 8 candles
with 16 ohms

~~100 ohms~~
32
98 lamp 10 C with 3
ohms.

Without augmentance
give 11 Cans

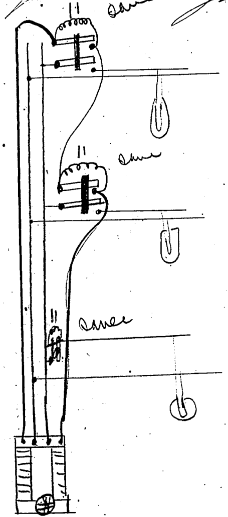


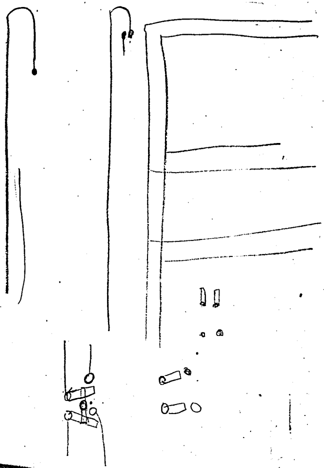
49

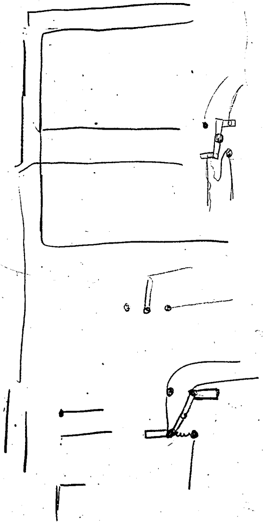


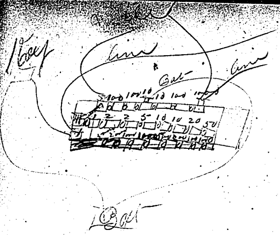
Jan 24 1881

Jehl

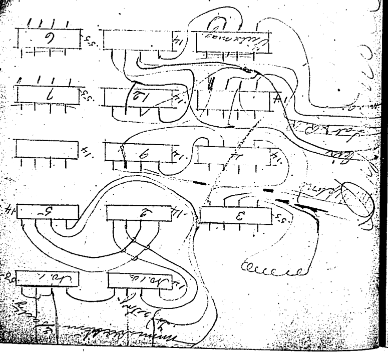

Same
Same
Same

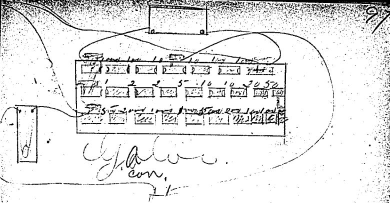





line
Bat
line
100 1000 10 10 100 1000
2 2 5 10 10 20 50
Bat

for tenths 10 x 100
" $\overline{100}$ 10 x 1000
" 0's 10 x 10

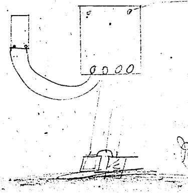



10
1
2
2
5
10
10
20
50

Galv. con.

For 1.0 remove 10 & 100
" 100 " 10 & 1000
" Ohms " 10 & 10

Tel. Con.



Battery Telephone con.

Directions for Attaching and using, Water's. Patent Engine Governor. In taking the Governor apart for the purpose of attaching the Valve Chamber to the Engine, the Top should be lifted off as true as possible so as not to spring or bend the Valve Stem.

/ 13

1030/65 1380
65

/ 69000
8280

1030) 89700 (87 V
8240
7300
7210

Speed of Disc Engine (Wests).

Oct. 23, 1880.

		Boiler Press.
9 P.m.	Speed 520	
10 P.m.	" 510	
11 "		
12 "	"	

Oct. 24, 1880.

9 a.m.	Speed 500	Boiler Pressure
10 "	500	40

Dyammo No 11

Magnets, 150 + 15 = 165

Magnets = 1.60 ohms

armature .20 - .055 = .145

~~1.2 - .5 = 1.47 ohms~~

Dijammo No 14

Armature, .14 ohms

magnet 1.47 ohms.

Polar Index of Lead
see Vol V. Pg 37

François

Henry B. Hyde

Michael Kerwell

Miss Mason

Michigan

Charleston

Five Eights 5/8

272

T A Edison

Geo B Prescott

J C Smith

J C Smith

J C Smith

Edison Electric Light Co

New York

273

TAE

TAE

T A Edison

T A Edison

Hickson

Anson

Arnold White

what

anson

1422

am 7 224

~~a bright spot near~~

~~The same~~

one ~~side~~ seemed to be
a great deal brighter
than ~~the~~ other
at 17 C 15 ft

No 1409

Very bad spots all over. without any Res it was 12.5 C

No 1412 [illegible]

[illegible]

[illegible]

[illegible]

14
9
17½
17½
17½
17

25
11
17½
17½
17½
10
198

17) 165 (9
3

8) 110 (14

288
1440
7200
36.200 ~~24~~
~~12~~ 5
1

44.00
50.00
90.00
200
17) 201 (11
17
31
3

17½
7½
25
0.1416

84
128
8
3.85
1.03

95
13.25
16.20
60
17.40